Molarity Questions

17. What is the molarity of a solution that contains 12.9 g of strontium hydroxide in 900. mL of solution?

18. What mass of ethylene glycol ($C_2H_6O_2$) is contained in 3.8 L of a 0.375 M solution?

19. How many millimoles of the amino acid alanine ($C_3H_7NO_2$) must be dissolved in 500. mL of water to make a 0.024 M solution?

20.What volume of water must be added to 125 mL of 0.750 M sulfuric acid solution to obtain a 0.250 M solution?

21. A solution of nitric acid is made by diluting 85.0 mL of 19.3 M acid to 200. mL. How many grams of nitric acid are contained in 40.0 mL of the diluted solution?

22.Describe how you would make a 0.10 M solution of $KMnO_4$ from (a) solid $KMnO_4$ and (b) from 0.50 M $KMnO_4$.

23.What mass (in grams) of each solute should be added: (a) to 200 g of water to form a 3.0% by mass KBr solution; (b) to 25.0 g water to form a 6.0% by mass silver nitrate solution; (c) to 500 g water to form a 10.5% by mass ethanol (C2H5OH) solution?

24.A lead-contaminated water sample contains 0.0011% Pb by mass. How much of the water (in mL) contains 150 mg of Pb? (Assume a density of 1.0 $g \cdot mL{-1}$.)

25.The concentration of C29H60 in summer rainwater collected in Hannover, Germany, is 34 ppb. Find the molarity of C29H60. Assume that the density of rainwater is close to 1.00 g/mL.

26.Any dilute aqueous solution has a density near 1.00 g/mL. Suppose the solution contains 1 ppm of solute; express the concentration of solute in g/L, µg/L, µg/mL, and mg/L.

27. A water sample is found to contain the pollutant chlorobenzene with a concentration of 15 ppb (by mass). What volume of this water contains 5.00×102 mg of chlorobenzene? (Assume a density of 1.00 $g \cdot mL{-1}$.)

17. 0.118 M

18. 88 g $C_2H_6O_2$

19. 12 mmol

20.250. mL

21. 20.7 g

22.Multiple ways – one way would be to add 15.8 g $KMnO_4$ to 1 L of water, or a 1:5 dilution of the 0.10 M solution

23.6.18 g KBr / 1.59 g $AgNO_3$ / 58.7 g CH_3CH_2OH

24. 1.36×10^7 mg solution

25.8.3×10^{-8} M

Molarity Questions

26.0.001 g/L = 1 mg/L = 1000 ug/L = 1 ug/mL

27. 3.3×10^{10} mg

Molarity Questions

1.   What is the difference between dilution and concentration?

2.   What quantity remains constant when you dilute a solution?

3.   A 1.88 M solution of NaCl has an initial volume of 34.5 mL. What is the final concentration of the solution if it is diluted to 134 mL?

4.   A 0.664 M solution of NaCl has an initial volume of 2.55 L. What is the final concentration of the solution if it is diluted to 3.88 L?

5.   If 1.00 mL of a 2.25 M H_2SO_4 solution needs to be diluted to 1.00 M, what will be its final volume?

6.   If 12.00 L of a 6.00 M HNO_3 solution needs to be diluted to 0.750 M, what will be its final volume?

7.   If 665 mL of a 0.875 M KBr solution are boiled gently to concentrate the solute to 1.45 M, what will be its final volume?

8.   If 1.00 L of an LiOH solution is boiled down to 164 mL and its initial concentration is 0.00555 M, what is its final concentration?

9.   How much water must be added to 75.0 mL of 0.332 M $FeCl_3$(aq) to reduce its concentration to 0.250 M?

10.   How much water must be added to 1.55 L of 1.65 M $Sc(NO_3)_3$(aq) to reduce its concentration to 1.00 M?

Answers

1.

Dilution is a decrease in a solution's concentration, whereas concentration is an increase in a solution's concentration.

3.

0.484 M

5.

2.25 mL

7.

401 mL

9.

24.6 mL